A Quality Improvement Project: Diagnosis and Treatment of Hypogonadism

Michael Shroth

South University

Abstract

Background: It is crucial to identify knowledge gaps in provider knowledge of evidence-based guidelines to improve patient outcomes when treating male hypogonadism.

Purpose: The purpose of this project was to evaluate and improve provider knowledge level of national guidelines through an educational intervention utilizing the Endocrine Society Clinical Practice Guideline (ESCPG) in a urology practice.

Methods: A pre/post-test questionnaire was used for this project. A pre-test questionnaire was distributed to participants and knowledge level of current guidelines was identified. An educational intervention was presented based on the national guidelines. A post-test questionnaire was then completed by participants to assess participant's knowledge after the educational intervention.

Results: Provider participants' knowledge level for the pre-test mean score (41.50 ± 4.183) was compared to post-test mean score (48.83 ± 1.169); a statistically significant difference was identified, 7.333 (95% CI, 3.049 to 11.618), $t = 4.40$, $p < 0.0070$. The paired t-test confirms a change in knowledge levels. While the p was statistically significant, caution is needed because of the small sample size. Based on the p-value of 0.0070, there is a 0.70% chance the results of this project could be random. The p-value is small, meaning the results are statistically significant.

Conclusions: It is likely that if knowledge level of providers increase, patient outcomes may improve as reported by Bleaman, Coplan, Spiegel and Roch (2011). Provider knowledge level has increased with all provider participants (Figure 3) and the educational intervention was effective when comparing the pre-and post-test total scores (Figure 3).

Keywords: hypogonadism, guidelines, evidence-based, national, endocrine society

A Quality Improvement Project: Diagnosis and Treatment of Hypogonadism

Approximately 1 in 4 men in America over the age of 30 have low testosterone. However, only 1 in 20 has symptoms linked to this deficiency (Vann, 2007). Vann (2007) goes on to say, some estimates propose the prevalence of low testosterone to impact about 13 million American men. As the American population ages, it is estimated that 39% of American men will develop hypogonadism (Tartavoulle & Porche, 2012). Patients with low testosterone are at an elevated risk of being over treated which can lead to the development of thrombocytopenia and hyperestrogenism. This project will identify gaps in provider knowledge of national guidelines for the management of low testosterone in a general urology practice in a southwestern urban area. Upon the identification of knowledge gaps, an educational intervention will be implemented with the goal of increasing provider awareness of evidence-based guidelines for the management of low testosterone.

Purpose

The purpose of this project was to evaluate and improve provider knowledge level of national guidelines through an educational intervention utilizing the Endocrine Society Clinical Practice Guideline (ESCPG) in a urology practice. The objectives of this project were to: (1) measure knowledge level of ESCPG for treatment of hypogonadism of six healthcare providers within a urological patient population, (2) develop an educational intervention for providers for diagnosis and treatment of hypogonadism following the ESCPG, and (3) measure the providers' knowledge of national guidelines after the educational intervention.

PICOT

PICOT: In providers in a urological practice treating patients who have hypogonadism, how does an educational intervention about current standards of practice affect knowledge level compared to pre-intervention knowledge level?

Goals

The goal of this project was to improve participant's knowledge of national guidelines. Improved provider knowledge will lead to accurate diagnosis and treatment of male hypogonadism. The expected outcome for this project was that providers would understand the ESCPG and incorporate the evidence-based guidelines for patient management. By adjusting their prescribing practices to that of the evidence-based based guidelines, patient outcomes will improve.

Design

A pre/post-test questionnaire was used for this project. A pre-test questionnaire was distributed to participants and knowledge level of current guidelines was identified. An educational intervention was presented based on the national guidelines. A post-test questionnaire was then completed by participants to assess participant's knowledge after the educational intervention.

Sample

The sample for this project included physicians (urologist), nurse practitioners, and physician assistants who volunteered to participate in the study. All providers at this clinic were board certified urologists, physician assistants, and nurse practitioners. Eight urologists, two nurse practitioners, and one physician assistant practice urology at this clinic. Five urologists are male and three females. Both nurse practitioners were male and the physician assistant was female. All healthcare participants at this clinic have practiced longer than seven years. Most of

the providers have additional training in male and female hormone replacement therapy and all are a convenience sample.

Setting

The setting for this project was a urology practice in southwestern town. This practice has several sites with multiple providers. This clinic accepts private insurance, Medicare, and Medicaid patients. There are generally 150-175 patients treated at three different clinics daily, some of who have been referred for low testosterone treatment. Most patients are referred to this practice since it is considered a specialty practice.

Data Collection Process

There was one questionnaire used to collect data during this project from the same provider participants; the same for the pre-and post-test questionnaires. The questions were constructed using a 5 point Likert Scale format for the pre-and post-test questionnaires to measure the knowledge level of the providers before and after the educational intervention. The Likert Scale is a commonly used scale to measure the degree in which participants agree or disagree with the opinion expressed by a statement (Polit & Beck, 2012). The questionnaire contained 10 statements and the participant numeric responses for each item were added together for total scores. The pre-and post-test questionnaires were developed by this researcher using research-based evidenced to address the PICOT question and distributed to all participants in the project.

Demographic variables including age, gender, professional role, and years of experience may impact results and were considered. The pre-and post-test questionnaires were coded for provider participants so comparisons could be made related to knowledge level. Content validity

was established since the ESCPG were used as the basis of the instrument. Reliability could be established by the test-retest method; however, reliability has yet not been established because of time restrictions for completion of this project.

Data Analysis

The pre-and post-test questionnaire scale ranges from 1-5, with 5 strongly agreeing with the statement and 1 strongly disagreeing. The Likert Scale measures variables at the ordinal level; however, the total score is considered interval data and I compared total pre-and post-test questionnaire scores. The values obtained from each item in the instrument were added together for a single score for each provider participant.

Demographics

This project included 6 (n=6) participants, 3 of whom were medical doctors (MD's); 1 female physician assistant (PA), and 2 male nurse practitioners (NP's). Two of the MD's are male and one is female (Figure 1 & 2). These six provider participants have a combined total of 26 years of practice.

Figure 1

Gender of Provider Participants

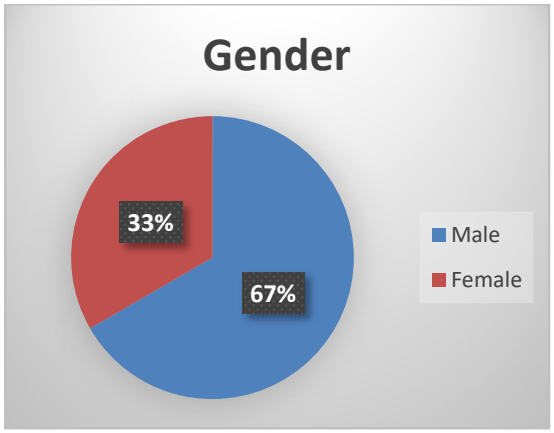
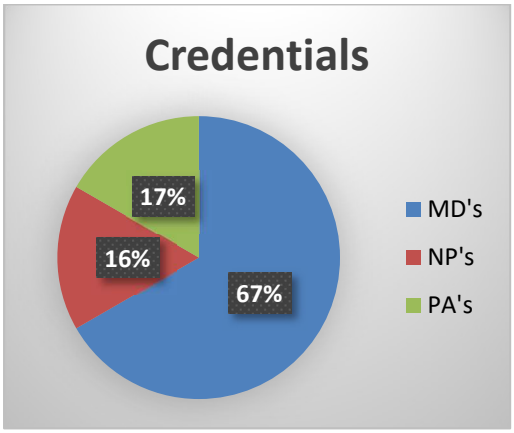


Figure 2

Credentials of Provider Participants



Using the Minitab Express (minitab.com) program, a paired t-test was performed on the total scores of the pre-and post-test questionnaires to determine whether there was a significant mean difference in knowledge level between the pre-and post-test questionnaires after the educational intervention. Provider participants' knowledge level for the pre-test mean score (41.50 ± 4.183) was compared to post-test mean score (48.83 ± 1.169); a statistically significant difference was identified, 7.333 (95% CI, 3.049 to 11.618), $t = 4.40$, $p < 0.0070$. The paired t-test confirms a change in knowledge levels. While the p was statistically significant, caution is needed because of the small sample size. Based on the p-value of 0.0070, there is a 0.70% chance the results of this project could be random. The p-value is small, meaning the results are statistically significant.

Pre-and Post-Test Questionnaire Results

Pre-test questionnaire results revealed a mean score of 41.50 out of a possible 50 points. The standard deviation for the pre-test questionnaire was 4.183 (Table 1). Post-test questionnaire results revealed a mean score of 48.83 out of a possible 50 points. The standard deviation for the post-test questionnaire was 1.169 (Table 1).

Table 1

Means Score of Pre-and Post-Test Questionnaires

Table 1 denotes the pre-and post-test questionnaires mean and standard deviation.

Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
Post-test	6	48.833	1.169	0.477
Pre-test	6	41.500	4.183	1.708

The participants scored an average of 48.8 with SEM +0/- 0.4733. This was a narrow range and indicates the sample represents the true population. The range of total scores was from 47.6065 to 50.0, which indicates a very narrow range, again, supporting the variability of the data.

Overall, all providers had an average of 7.33% increase in knowledge level from pre-to post-test questionnaires after the educational intervention. All six provider participants indicated that they are now aware of the ESCPG and all agree that they will utilize the evidence-based guidelines. All providers indicated they plan to change their current treatment of patients if the treatment is not evidence-based. Provider 001 had an increase in knowledge level from 70% to 94%, provider 002 from 92% to 98%, provider 003 from 92% to 96%, provider 004 from 84% to 98%, provider 005 from 80% to 100%, and provider 006 increase from 80% to 100% (Figure 3).

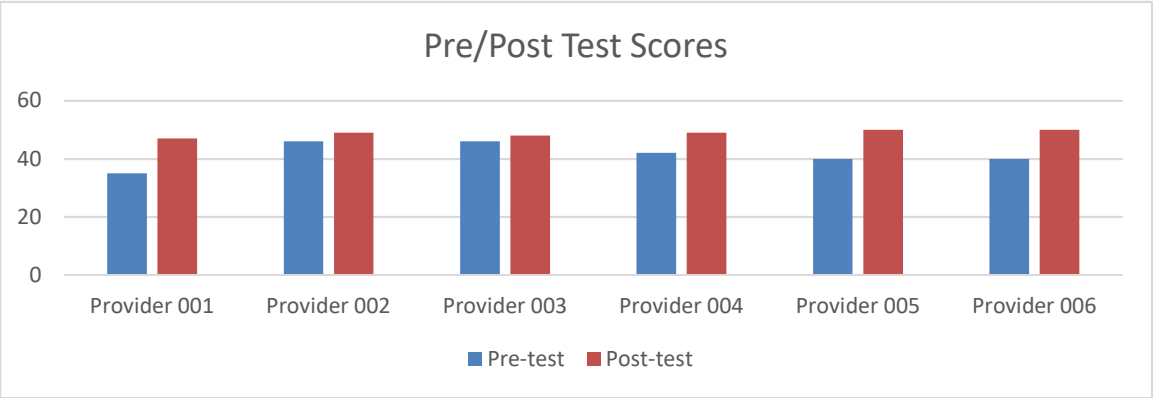
There is convincing evidence ($t = 4.40$, $p = 0.007$) that the educational intervention improved scores. The total scores improved, on average, by approximately 7 points. It is important to look at the 95% Confidence Interval (95% CI). In this project, the 95% CI is from 3.049 to 11.618. This confirms that, although the difference in scores is statistically significant, it is relatively small. We can be 95% sure that the CI contains the true population.

Several participants scored low on the pre-test questionnaire when asked about their knowledge of ESCPG and if they incorporate the national guidelines in their practice. Four out of six providers acknowledged that treatment should be stopped when hematocrit levels reach 54%. One-hundred percent of all six provider participants indicated on the questionnaire they plan to change their current treatment of patients if it is not evidence-based.

Figure 3

Pre-and Post-Test Questionnaire Scores

Figure 3 bar graph denotes data comparison between pre-and post-test questionnaire scores.



Discussion

Data collection and analysis were completed within a two-week timeframe. Consents were signed and pre-test questionnaires were distributed by hand. Analysis of the total pre-test questionnaire scores began. Provider participants then participated in an educational intervention as planned, using a power point presentation on March 14, 2017. Upon completion of the educational intervention, post-test questionnaires were immediately distributed to the provider participants and promptly completed.

The purpose of this project was to evaluate and improve provider knowledge level of the ESCPG through an educational intervention utilizing the ESCPG in a urology practice. The objectives of this project are to (1) measure knowledge level of ESCPG for treatment of hypogonadism of 5-11 healthcare providers within a urological patient population, (2) develop an educational intervention for providers for diagnosis and treatment of hypogonadism following

the ESCPG, and (3) measure the providers' knowledge of national guidelines after the educational intervention.

The purpose and objectives of this project have been achieved. Provider knowledge level of the national guidelines has been measured, an educational intervention presented, and post-educational intervention scores evaluated and compared. Provider knowledge level has increased with all provider participants (Figure 3) and the educational intervention was effective when comparing the pre-and post-test total scores (Figure 3).

The Donabedian Model used for this project provided the framework for quality improvement implementation. Ultimately, the goal of evidence-based practice is to improve quality of care by improving patient outcomes. This model helped to conceptualize variables that contributed to inadequate quality of care for patients (Liu, Singer, Sun & Camargo, 2011). Using the Donabedian Model, the structure of the system was the urology practice, the process of care was the educational intervention and post-test questionnaire, and the health outcome was the increased provider knowledge related to the ESCPG. This was the framework used to guide this project into practice.

When reviewing the literature, Lee (2014) found that current evidence-based knowledge and treatment of testosterone replacement therapy has been inadequately assessed and treated. This article relates to this authors study since it assessed knowledge of national guidelines. Our findings support the findings by Lee (2014) since knowledge levels increased after the educational intervention. Morales et al. (2015) identified and addressed the knowledge gaps among multidisciplinary providers in their clinical decision-making in managing testosterone deficiency syndrome. This article relates to this our study because knowledge gaps among

multidisciplinary providers when treating low testosterone were assessed, and none were identified between professional roles. Our findings do not support the findings of Morales et al. (2015).

Implications for Future Research

Further study is needed to explore the effects of a more robust educational intervention based on all the national guidelines. While this study and existing literature suggest that educational interventions improve provider knowledge of evidence-based guidelines, a longitudinal study to explore the impact of the educational intervention on practice and patient outcomes is needed. Also, reliability of the pre-and post-test questionnaire could be established by the test-retest method with future studies that are not restricted by time.

Strengths and Limitations of the Study

A strength of this study is that it lays the ground work for future studies looking at the impact of increased provider knowledge of evidence-based national guidelines on patient outcomes. Also, in advanced practice, multiple providers should be included when they are practice at the same level. A challenge for this study is that the provider participants were a convenience sample from the same urology practice. Therefore, the selection of provider participants may have been based on motivation, availability, and engagement. The pre-and post-test questionnaires were self-reported, which could have led to bias by method variance. Other limitations of this study are the small sample size, and the primary researcher being employed at the clinic as a provider.

Budget

The cost for this project was very minimal. Questionnaires were developed, printed, distributed, and analyzed for this project. Computers and scanners were used to include hardware and software. Office supplies were used as well as skilled man-hours to direct and analyze the data.

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